BIG SAND WASH RESERVOIR

Introduction

Big Sand Wash Reservoir is in the Uinta Basin north of Duchesne and Roosevelt. It is a large reservoir and is popular for water recreation. It is located on a terrace along the Lake Fork River, receiving river water via canal.

Big Sand Wash Reservoir was created in 1965 by the construction of an earth-fill dam. The reservoir shoreline is 98% privately owned, with the state owning a small segment of shoreline at the boat ramp. Public access is unrestricted. Water is consumed for irrigation, but also used for recreation and coldwater aquatic habitat. Changes in water use are unlikely. However, some adjustments may be required if the reservoir is enlarged as planned under the Central Utah Project. The reservoir is also noteworthy for a large fleet of inoperative 1957 Chevrolets parked nearby.

Characteristics and Morphometry

Lake elevation (meters / feet)	1,794 / 5,885
Surface area (hectares / acres	158 / 390
Watershed area (hectares / acres)	34,256 / 83,647
Volume (m^3 / acre-feet)	
capacity	1.49×10^7 / 12,100
conservation pool	1.48×10^6 / 1,200
Annual inflow (m^3 / acre-feet)	11,481,418 / 9,308
Retention time (years)	1.3
Mean annual vertical fluctuation (meters / feet)	14/ 46
Depth (meters / feet)	
maximum	31 / 102
mean	4.6 / 31
Length (meters / feet)	2,900 / 9,500
Width (meters / feet)	1,200 / 3,900
Shoreline (km / miles)	10.4 / 6.5

Location

County	Duchesne
Longitude / Latitude	110 13 17 / 40 18 02
USGS Map	Bluebell, 1965
DeLorme's Utah Atlas & Gazetteer™	Page 55, D-6
Cataloging Unit	Duchesne (4060003)

Recreation

Big Sand Wash Reservoir is located on U-87 one mile

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north of the village of Upalco in the Uinta Basin. From US-40, turn north at milepost 98.2 (about 9 miles east of Duchesne), northwest on old US-40 towards Bridgerland. Follow this road for a mile, then north-east and north on a paved country road for about 8 miles to U-87. Turn left on U-87 and continue north for 2 miles, through Upalco, to where U-87 bends to the northwest. At the bend, continue due north on an unpaved county road for 0.75 miles to the boat ramp access. Pedestrian access is possible from U-87.

At milepost 105 (16 miles east of Duchesne), there is a sign to a Big Sand Wash Boatramp south of the highway. This is ***not*** Big Sand Wash Reservoir.

Fishing is the primary recreational use of the reservoir. The 1,200 acre-foot conservation pool provides permanent fish habitat. Boating is the only other major recreational use of the reservoir, but swimming and waterskiing are possible.

The boat ramp and some privies are the only recreational facilities at the reservoir. There are numerous USFS campgrounds north of the reservoir along the Lake Fork and Yellowstone Rivers. There is a private campground in Roosevelt (see info box).

Watershed Description

Big Sand Wash Reservoir is located at the north edge of the Uinta Basin, south of the south slope of the Uintas. It has a small, dry (8 - 12 inches/year precipitation) watershed that is supplemented by a diversion from the Lake Fork River. The diversion drains areas of the High Uintas that receive up to 40 inches precipitation annually. The headwaters of the Lake Fork River and its tributary, the Yellowstone River, are in the central High Uintas. Kings Peak, the highest mountain in Utah, is at the headwaters of the Yellowstone. The high mountains are surrounded with glacial valleys, which are filled with forest, meadows, and glacial lakes. Much of this area is protected as federal wilderness.

The rivers cascade out of the Uintas, then turn into slow streams in the Uinta Basin, filling only a fraction of the channel carved by the melting glaciers. Big Sand Wash Reservoir is an impoundment of a shallow channel cut through the soft soil of the Uinta Basin.

The watershed high point, Kings Peak, is 4,123 m (13,528 ft) above sea level, thereby developing a complex slope of 4.4% to the reservoir. The average stream gradient of the canal is 1.4% (71 feet per mile) and the average gradient of the Lake Fork River in the 10 km above the diversion is 1.7% (90 feet per mile). In the upper reaches of the watershed, gradients are considerably greater. The inflows consist of Big Sand Wash (an ephemeral stream) and the Lake Fork Canal from Lake Fork River. The outflows are also Big Sand Wash and Lake Fork Canal. Moon Lake and Twin Pots Reservoir are artificial impoundments upstream on the Lake Fork River. There are many of natural lakes in the watershed, including Kidney Lake, Brown Duck Lake, Island Lake, Crater Lake, Bluebell Lake, Timothy Lakes, Rainbow Lake and Water Lily Lake.

The watershed is made up of high mountains with rock outcroppings, alluvial fans, floodplains, foothills, plateaus, badlands and valleys. The soil associations that compose the watershed are listed in Appendix III.

The vegetation communities consist of pine, aspen, spruce-fir, oak-maple, alpine tundra, pinyon-juniper, shadscale, greasewood and sagebrush grass. The watershed receives 20 - 102 cm (8 - 40 inches) of precipitation annually. The frost-free season around the reservoir is 120 - 140 days long.

According to the 1982 Clean Lakes Inventory, land use is multiple use (80% with uses restricted in the wilderness area), private grazing lands (10%), agriculture (6%), and recreation (4%).

Limnological Assessment

The water quality of Big Sand Wash is very good. It considered to be moderately hard with a hardness concentration range of 107-9 mg/L (CaCO3). No parameters monitored have been found exceeding State standards for defined beneficial uses of the reservoir. Nutrient levels are considered low and the phosphorus concentrations are below the recommended pollution indicator value of 0.25 mg/L. The Reservoir is to be nitrogen limited with low nitrogen/phosphorus ratios. The reservoir has been consistently classified as a mesotrophic system. TSI values have remained consistently stable near 45-46.

Although the reservoir probably stratifies during midsummer recent profiles taken either early or later summer do not show the reservoir as stratified. However, in 1981 when the water depth was at 19 meters, a thermocline was developing near the 5 meter depth. Without the presence of a thermocline which would stratify the reservoir, the reservoir maintains a fairly high concentration of dissolved oxygen throughout the water column. It is interesting to note that under the conditions in 1981, dissolved oxygen concentrations declined with increasing depth to a value of 4.0--4.2 mg/L near the bottom of the reservoir. In addition profiles obtained when the reservoir is nearer capacity indicate there is a definite decline in the concentrations of dissolved oxygen throughout the water column.

According to DWR stocking records Big Sand Wash Reservoir is typically stocked with approximately 45,000 fingerling rainbow trout (*Oncorhynchus mykiss*) and on occasion 15,000 fingerling cutthroat trout (*Oncorhynchus clarki*. DWQ records indicate that emergent macrophytes are very limited in the reservoir.

Limnological Data

Data sampled from STORET site: 593352

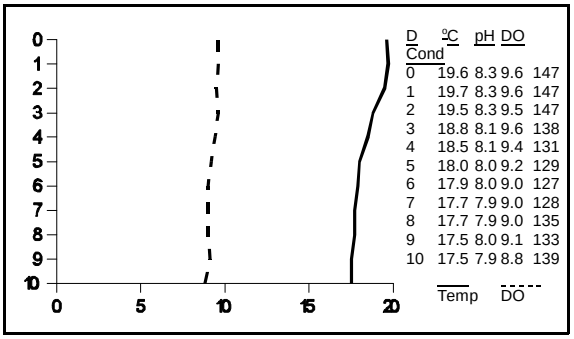
Surface Data	1981	1989*	1991
Trophic Status	M	M	M
Chlorophyll TSI	-	45.13	47.59
Secchi Depth TSI	54.1	45.16	53.23
Phosphorous TSI	37.3	48.05	35.01
Average TSI	45.7	46.11	45.28
Chlorophyll a (ug/L)	-	4.4	5.65
Transparency (m)	1.5	2.8	1.6
Total Phosphorous (ug/L)	5	21	9
pH	8.1	8.4	8.4
Total Susp. Solids (mg/L)	<5	-	<3
Total Volatile Solids (mg/L)	-	-	5
Total Residual Solids (mg/L)	-	-	<3
Temperature (°C / °f)	20/69	21/70	19/66
Conductivity (umhos.cm)	163	172	209
Water Column Data			
Ammonia (mg/L)	0.1	<0.01	0.04
Nitrate/Nitrite (mg/L)	.08	-	0.03
Hardness (mg/L)	109	-	99.3
Alkalinity (mg/L)	94	-	84
Silica (mg/L)	-	-	6.8
Total Phosphorus (ug/L)	12.5	19	11
Miscellaneous Data			
DO (Mg/l) at 75% depth	5.8	6.7	9.0
Stratification (m)	5-6	NO	NO
Limiting Nutrient	N	N	N
Depth at Deepest Site (m)	19	8.3	10

Small areas have developed in the areas near the inlet as sediments have accumulated and water levels decreased. At the present time Big Sand Wash Reservoir is used as an irrigation source and for recreation which includes boating and fishing. This reservoir may later be used as a source for culinary water.

The reservoir has not been chemically treated by the DWR to eliminate rough fish competition, so populations of native fishes may be present in the reservoir.

Phytoplankton in the euphotic zone include the following taxa (in order of dominance)

Species	Cell Volume (mm^3/liter)	% Density By Volume
Ceratium hirundinella	2.809	97.44
Euglena sp.	0.041	1.42
Ankistrodesmus falcatus	0.014	0.45
Microcystis incerta	0.011	0.39
Pennate diatoms	0.003	0.12
Centric diatoms	0.003	0.11



Wislouchiella planktonica	0. 0 0 2
0.08	
Total	2.883
Shannon-Weaver [H']	0.15
Species Evenness	0.08
Species Richness	0.28

Ceratium sp. are red algae and can be found in both mesotrophic and eutrophic conditions.

Pollution Assessment

Nonpoint pollution source activities include grazing, logging, recreation and agriculture.

Grazing takes place throughout the watershed, and in the vicinity of the reservoir. Logging takes place in the upper parts of the watershed, but any effects are unlikely to affect the reservoir.

There are no point sources of pollution in the watershed.

Information

Management Agencies	
Uinta Basin Association of Governments	722-4518
Division of Wildlife Resources	789-3103
Division of Water Quality	538-6146
Ashley National Forest	377-5780
Duchesne Ranger District	738-2482
Recreation	
Dinosaurland Travel Region (Vernal)	789-6932
Duchesne Chamber of Commerce	738-5651/738-2707
Reservoir Administrators	
Moon Lake Water Users Association	722-2002
Division of Wildlife Resources	789-3103

Beneficial Use Classification

The state beneficial use classifications include:

culinary water (1C), boating and similar recreation (excluding swimming) (2B), cold water game fish and organisms in their food chain (3A) and agricultural uses (4).